

REMARKS

New claims 57-62 are added. The new claims are supported by the exemplary embodiments of Applicant's invention described at, for example, pages 5-6 and 8. Claims 29-49 and 51-62 remain in the application. Reconsideration of the application in view of the amendments and the remarks to follow is requested.

Claims 45-47 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kropp et al. (5,362,421) in view of Tuttle (5,558,679). Claims 48 and 49 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kropp et al. in view of Tuttle ('679) and further in view of Chen et al. (4,975,221). Claims 45 and 48-49 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chen et al. in view of Tuttle ('679). Claims 46-47 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chen et al. in view of Tuttle ('679) and further in view of Tsukagoshi et al. (5,843,251), Kropp et al., or Inoue et al. (5,728,473). Claims 29, 32-36, and 51-52 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tuttle ('679) in view of Chen et al. Claims 30 and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tuttle ('679) in view of Chen et al. Claims 37, 40-44 and 53-56 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tuttle ('679) in view of Chen et al. and further in Tuttle (5,646,592). Claims 38 and 39 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tuttle ('679) in view of Chen et al. and further in view of Tuttle ('592), and further in view of Tsukagoshi et al., Kropp et al., or Inoue et al.

Independent claim 29 recites a conductive adhesive mass electrically interconnecting a thin profile battery with a node location, the conductive adhesive mass comprising an epoxy terminated silane. The Examiner relies on Tuttle to allegedly teach mounting a battery on a substrate with an electrically conductive epoxy and correctly states that Tuttle is silent as to teaching the epoxy adhesive has a terminated silane (page 5 of paper no. 13 referring to paper 10, page 6). The Examiner next relies on Chen to modify Tuttle and alleges Chen teaches that it is well known and conventional to include epoxy terminated silanes adhesive promoters (sic) in adhesives when bonding together electrical components, and therefore, it would have been obvious to one of ordinary skill in the art to include epoxy terminated silanes in the adhesive of Tuttle in order to promote adhesion (page 5 of paper no. 13 referring to paper 10, page 6).

Accordingly, Applicant now presents with this response a declaration by Rickie Lake, a person skilled in the art, pursuant to 37 C.F.R. §1.132, demonstrating that it is not obvious to one of ordinary skill in the art to include epoxy terminated silanes in the adhesive of batteries. At the time of the above-referenced invention, one skilled in the art did not understand the source of the problem for the poor conduction of the prior art conductive bonding of a battery. Poor wetting characteristics of the conductive epoxy with the metal outer surface of the battery, which typically comprises a nickel-clad stainless steel, simply were not understood to be a problem at the time of the above-referenced invention. Moreover, at the time of the above-referenced invention, silane additives for

epoxy were not known to have been utilized within conductive epoxies for electrical bonding of the conductive epoxies with nickel surfaces of batteries. These contentions are clearly evident by the declaration and, additionally, by the fact that the Examiner has failed to locate one reference that teaches wetting characteristics of adhesives for batteries, nor one reference teaching batteries using silane additives within conductive epoxies for electrical bonding of batteries.

Once Rickie Lake perceived that the relatively poor conduction of the prior art conductive bonding of a battery resulted from poor wetting characteristics of the conductive epoxy with the metal outer surface of the battery, he added an epoxy-terminated silane to conductive adhesives to be bonded with batteries. The epoxy-terminated silane significantly improved the wetting characteristics of the conductive adhesives relative to metal surfaces to be bonded, such as nickel-clad stainless steel of a battery, in a manner which was not understood to have been reported or known in the prior art at the time of the above-referenced invention.

Accordingly, it is **not well known and conventional** to include epoxy terminated silanes adhesive promoters in adhesives when bonding together electrical components such as batteries, and therefore, it is **not obvious** to one of ordinary skill in the art to include epoxy terminated silanes in the adhesive of Tuttle in order to promote adhesion. The Examiner has simply relied upon Applicant's disclosure for teachings, which is impermissible hindsight, to allege the claims are obvious. Accordingly, the combination of art fails to teach or

suggest a conductive adhesive mass electrically interconnecting a thin profile battery with a node location, the conductive adhesive mass comprising an epoxy terminated silane as positively recited in claim 29. The obviousness rejection is improper, and therefore, independent claim 29 is allowable. Applicant respectfully requests withdrawal of the rejection against claim 29 in the next office action.

Claims 30-36, 51-52 and 57-58 depend from independent claim 29, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

Independent claim 37 recites a thin profile battery conductively bonded with a second portion of substrate conductive paths by a conductive adhesive mass, the conductive adhesive mass comprising an epoxy terminated silane. The Examiner alleges this limitation is taught based on the same combination of Tuttle and Chen, and based on the same rationale, as applied to independent claim 29 discussed above (page 6 of paper 13 referring to paper 10, page 9). The §1.132 Declaration by Rickie Lake demonstrates that it is not obvious to one of ordinary skill in the art to include conductive adhesive mass comprising an epoxy terminated silane in the adhesive of batteries. Consequently, it is inconceivable that the combination of art teaches or suggests a thin profile battery conductively bonded with a second portion of substrate conductive paths by a conductive adhesive mass, the conductive adhesive mass comprising an epoxy terminated silane as positively recited in claim 37. Claim 37 is allowable

and Applicant respectfully requests withdrawal of the rejection against independent claim 37 in the next Office Action.

Claims 38-44, 53-56 and 59-60 depend from independent claim 37, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

Independent claim 45 recites an electric circuit comprising first and second electric components electrically connected with one another through a conductive adhesive mass comprising an epoxy terminated silane, and wherein at least one of the first and second electric components comprises a nickel containing metal surface over which the conductive adhesive mass is received. The Examiner first relies on the combination of Kropp and Tuttle for rejecting independent claim 45 alleging that Kropp teaches an electrically conductive adhesive composition comprising an epoxy with a glycidoxypropyltrimethoxysilane coupling agent and correctly states Kropp is silent as to teaching one of the electronic components having a nickel metal surface (pg. 2 of paper no. 13). The Examiner next relies on Tuttle to modify Kropp and alleges that Tuttle teaches a metal surface containing nickel wherein it is obvious to one skilled in the art to connect an electrical component with a nickel metal surface to another electrical component in Kropp as suggested in Tuttle (pgs. 2-3 of paper no. 13).

The declaration by Rickie Lake demonstrates that it is **not** obvious to one of ordinary skill in the art to electrically connect first and second electric components with one another through a conductive adhesive mass comprising an

epoxy terminated silane, and wherein at least one of the first and second electric components comprises a nickel containing metal surface as positively recited in claim 45. At the time of the above-referenced invention, one skilled in the art did not understand the source of the problem for the poor conduction of the prior art conductive bonding of a battery. Poor wetting characteristics of the conductive epoxy with the metal outer surface of the battery, which typically comprises a nickel-clad stainless steel, simply were not understood to be a problem at the time of the above-referenced invention. Moreover, at the time of the above-referenced invention, silane additives for epoxy were not known to have been utilized within conductive epoxies for electrical bonding of the conductive epoxies with nickel surfaces of batteries. These contentions are clearly evident by the declaration and, additionally, by the fact that the Examiner has failed to locate one reference that teaches wetting characteristics of adhesives for batteries, nor one reference teaching batteries using silane additives within conductive epoxies for electrical bonding of batteries.

Once Rickie Lake perceived that the relatively poor conduction of the prior art conductive bonding of a battery resulted from poor wetting characteristics of the conductive epoxy with the metal outer surface of the battery, he added an epoxy-terminated silane to conductive adhesives to be bonded with batteries. The epoxy-terminated silane significantly improved the wetting characteristics of the conductive adhesives relative to metal surfaces to be bonded, such as nickel-clad stainless steel of a battery, in a manner which was not understood to have been reported or known in the prior art at the time of the above-referenced

invention. Consequently, the obviousness rejection based on the improper combination of art must fail. The Examiner has simply impermissibly relied upon the Applicant's disclosure for teachings to allege the claims are obvious. Applicant respectfully requests withdrawal of this rejection against claim 45 in the next office action.

An additional rejection against claim 45 is based on the combination of Chen and Tuttle alleging Chen teaches an epoxy adhesive having a functional silane (sic) adhesion promoter for attaching electrical components (pgs. 3-4 of paper no. 13). The Examiner next suggests modifying Chen with teachings of Tuttle alleging Tuttle teaches interconnecting electronic components via an epoxy adhesive wherein the components comprise a metal surface containing nickel, and therefore, it would be obvious for one skilled in the art to connect an electrical component with a nickel containing metal surface to another electrical component in Chen as suggested in Tuttle (pages 3-4 of paper no. 13). The declaration by Rickie Lake demonstrates that it is not obvious to one of ordinary skill in the art to electrically connect first and second electric components with one another through a conductive adhesive mass comprising an epoxy terminated silane, and wherein at least one of the first and second electric components comprises a nickel containing metal surface as positively recited in claim 45. Consequently, the obviousness rejection based on the improper combination of art must fail. Applicant respectfully requests withdrawal of this rejection against claim 45 in the next office action.


Since no other rejections are presented against claim 45, such claim is allowable.

Claims 46-49 and 61-62 depend from independent claim 45, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

This application is now believed to be in immediate condition for allowance, and action to that end is respectfully requested. If the Examiner's next anticipated action is to be anything other than a Notice of Allowance, the undersigned respectfully requests a telephone interview prior to issuance of any such subsequent action.

Respectfully submitted,

Dated: 1-27-04

By: 
D. Brent Kenady
Reg. No. 40,045